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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/471,520	12/23/99	PAPATHOMAS	K EN995064BV

005409

IM22/1031

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EXAMINER

BERMAN, S

ART UNIT	PAPER NUMBER
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1711

12

DATE MAILED: 10/31/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	09/471,520	PAPATHOMAS ET AL.	
	Examiner	Art Unit	
	Susan W Berman	1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 October 2001.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                  | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____  |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)         | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ | 6) <input type="checkbox"/> Other: _____                                    |

***Response to Amendment***

The amendment filed 10-01-2001 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: recitation in claims 1 and 8 of a filler that has been surface treated with an effective amount of a surface treating agent. The specification, on page 24, discloses surface treating agents but does not set forth what surface is to be treated. The specification, on page 25, discloses silica but does not mention surface treated silica. The Examples employ "Novacup L337 silica". The examiner has not found any disclosure that Novacup L337 silica is a surface treated silica.

Applicant is required to cancel the new matter in the reply to this Office Action.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-6 and 8-18 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for addition of fillers and use of surface treating agents, does not reasonably provide enablement for filler treated with an effective amount of surface treating agent. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. There is no disclosure of a surface treated filler or of a method for surface treating a filler within the disclosure as originally filed. See pages 24 and 25.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-12, 16 and 17 are rejected under 35 U.S.C. 103(a) as being obvious over Gelorme et al (5,464,726) in view of Christie et al (5,250,848). Gelorme et al disclose a cyanate ester compositions comprising a cationically polymerizable cyanate ester monomer or oligomer, a modifier, a filler, and a photoinitiator. See column 2, lines 29-52, column 3, lines 38-50, column 7, lines 13-43, column 8, line 11, to column 13, line 68, and column 14, lines 48-50. Gelorme et al teach using iron arene photoinitiators, which meet the requirement for an organometallic complex salt having a metal cation. Gelorme et al teach modifiers (columns 8-13) which correspond to those disclosed in the instant specification on pages 25-28. For examples, Gelorme et al teach blending thermoplastic or thermosetting polymers or oligomers such as epoxies, polyetherimides, polyimides, polyesters, polysulfones, acrylonitrile-butadiene-styrene polymers with the cyanate esters. Epoxidized novolac polymers and polyepoxides from haloepoxyalkanes and a polynuclear dihydric phenol are specifically mentioned. With respect to the functional language in the instant claims, it is the examiner's position that since the same fillers and modifiers are disclosed by Gelorme et al as are disclosed in the instant specification, the fillers and modifiers disclosed by Gelorme et al would inherently provide the same function. With respect to claim 6, Gelorme et al teach that solvents can be included when desired, therefore, solvents are not required.

Gelorme et al teach that the disclosed compositions can contain fillers such as fumed silica, quartz, etc., but do not mention surface treated fillers or silane compounds corresponding to those set forth in claims 13, 14 and 18 (column 13, lines 54-60). Christie et al teach compositions comprising epoxides and/or curable cyanate esters, reactive modifier and a filler that is optionally treated with a coupling agent. See column 5, lines 3-28. It would have been obvious to one skilled in the art to employ a

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filler such as the optionally surface treated filler in analogous compositions taught by Christie et al as the filler in the compositions taught by Gelorme et al. Gelorme et al provide motivation by teaching addition of filler. Christie et al provide motivation to employ a filler having a particle size less than 31 microns and substantially free of alpha particle emissions so that the compositions will readily flow into gaps between a chip and substrate carrier and to avoid generation of electron/hole pairs. Christie et al teach that the preferred filler can be treated with a coupling agent.

Claims 1-12, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ayano et al (4,383,903) in view of Christie et al (5,250,848). See the Abstract, columns 3-7, column 10, lines 20-23, and lines 44-47. Ayano et al disclose compositions comprising organo metal salts as heat curing catalysts. Ayano et al teach adding liquid or elastic rubbers having one or more (meth)acryloyl groups that would be expected to act as toughening agents (column 7, lines 1-9). It would have been obvious to one skilled in the art at the time of the invention to employ the organo metal catalysts as photoinitiators because it is well known in the art that the organo metal catalysts disclosed are activated upon photolysis as well as upon heating to provide photocurable compositions.

Ayano et al teach that the disclosed compositions can contain fillers but do not mention surface treated fillers or silane compounds corresponding to those set forth in claims 13, 14 and 18 (column 10, lines 41-47). Christie et al teach analogous compositions comprising epoxides and/or curable cyanate esters, reactive modifier and a filler that is optionally treated with a coupling agent. See column 5, lines 3-28. It would have been obvious to one skilled in the art to employ a filler such as the optionally surface treated filler in analogous compositions taught by Christie et al as the filler in the compositions taught by Ayano et al. Ayano et al provide motivation by teaching addition of filler. Christie et al provide motivation to employ a filler having a particle size less than 31 microns and substantially free of alpha particle emissions so that the compositions will readily flow into gaps between a chip and substrate carrier

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and to avoid generation of electron/hole pairs. Christie et al teach that the preferred filler can be treated with a coupling agent.

Claims 1-12, 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaku et al (4,533,727) in view of McCormick et al (5,215,860) and Shimp (4,709,008) and further ) in view of Christie et al (5,250,848). Gaku et al disclose cyanate ester compositions comprising photocrosslinking monomers, thermosetting monomers and/or thermoplastic resins (columns 5-7). Gaku et al teach blending compounds "B" with curable resin "A". Compounds B include compounds (B)(iv), which are thermosetting monomers or prepolymers, and compounds (B)(v), which include rubbers, polysulfone, polyimides, polyesters and other resins. Fillers and reinforcing agents may be added (column 8). Photoinitiators, including diphenyl iodonium, and heat curing catalysts are taught in columns 5-6 but do not include organometallic photoinitiators.

McCormick et al, in analogous art, teach that an organometallic compound curing agent can be used in an "energy-curable" cyanate composition. McCormick et al teach that organometallic compounds provide curing, including radiation curing, at lower temperatures or faster rates than previous catalysts, allow easier coating, provide temperature control and can be used to provide 100% reactive compositions (column 2, line 61, to column 3, line 20). Shimp discloses cyanate ester compositions which can be cured by heat and comprise catalysts such as zinc octanoate, etc. (column 3, lines 42-64). Additives taught include thermoplastic resin tougheners, reinforcing fibers, colloidal silica, mineral fillers and pigments (column 4, lines 27-32).

It would have been obvious to one skilled in the art at the time of the invention to include thermosetting prepolymers disclosed as (B)(iv) and/or rubbers or resins disclosed as (B)(v) in the compositions taught by Gaku et al since Gaku et al teach blending these compounds with curable resin A. One skilled in the art at the time of the invention would have been motivated by an expectation of

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providing toughening to the curable resin since thermoplastics, thermosetting and rubber materials such as those disclosed by Gaku et al are well known in the art for providing toughening to curable compositions. Shimp provides additional motivation by teaching that thermoplastic resin tougheners can be added to compositions of cyanate esters. It would have been obvious to one skilled in the art at the time of the invention to employ organometallic catalysts and radiation curing, as taught by McCormick et al, with the compositions disclosed by Gaku et al. Gaku et al provide motivation by teaching that photoinitiators and radiation curing can be used. McCormick et al teach the advantages of the organometallic salt photoinitiators for curing cyanate ester compositions.

Gaku et al teach that the disclosed compositions can contain fillers but do not mention surface treated fillers or silane compounds corresponding to those set forth in claims 13, 14 and 18 (column 8, lines 23-46). Christie et al teach analogous compositions comprising epoxides and/or curable cyanate esters, reactive modifier and a filler that is optionally treated with a coupling agent. See column 5, lines 3-28. It would have been obvious to one skilled in the art to employ a filler such as the optionally surface treated filler in analogous compositions taught by Christie et al as the filler in the compositions taught by Gaku et al. Gaku et al provide motivation by teaching addition of filler. Christie et al provide motivation to employ a filler having a particle size less than 31 microns and substantially free of alpha particle emissions so that the compositions will readily flow into gaps between a chip and substrate carrier and to avoid generation of electron/hole pairs. Christie et al teach that the preferred filler can be treated with a coupling agent.

Claims 13-15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gelorme et al (5,464,726) or Ayano et al, each in view of Christie et al (5,250,848), as applied to claims 1, 7 and 8 above, and further in view of Swei (5,182,173). Claims 13-15 and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gaku et al (4,533,727) in view of McCormick et al (5,215,860) and Shimp

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(4,709,008) and further ) in view of Christie et al (5,250,848), as applied to claims 1, 7 and 8 above, and further in view of Swei.

Swei disclose a composite filler material that is a filler material, such as silica, coated with a layer of silicone elastomer. The fillers are suitable for use in matrix materials such as cyanate esters. The silicone elastomer is the reaction product of a multifunctionally terminated polysiloxane and a silane crosslinking agent. See column 1, lines 30-49, column 2, lines 12-32 and column 5, lines 39-50. It would have been obvious to one skilled in the art to employ the composite filler material taught by Swei as the filler in each of the prior art compositions. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation of producing a highly filled polymeric matrix material having improved ductility and toughness, as taught by Swei.

*Continued Examination Under 37 CFR 1.114*

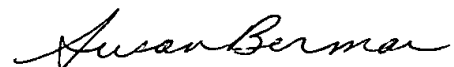
A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 10-01-2001 has been entered.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan Berman whose telephone number is (703) 308-0040.

The fax number for this group is (703) 872-9310 or, for submissions after Final Rejection, (703) 872-9311.

Any inquiry of a general nature or relating to the status of this application should be directed to the Customer Service telephone number (703) 306-5665.

S B  
10/29/01



Susan Berman  
Primary Examiner  
Art Unit 1711